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| 10/758,759      | 01/15/2004  | Jonathan N. Payne    | NSCIP292/P05784     | 6398             |

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| EXAMINER |
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BLEVINS, JERRY M

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2883

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01/25/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/758,759

Applicant(s)

PAYNE, JONATHAN N.

Examiner

Jerry Martin Blevins

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 November 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments with respect to claim 1-11 and 18-24 have been considered but are moot in view of the new ground(s) of rejection.

Specifically, although examiner maintains that the prior art reference to Sugama teaches the claimed limitations, the entirety of the claimed limitations is not found within any one embodiment of Sugama. As such, an obviousness-type, and not an anticipatory, rejection is in order.

Applicant's arguments filed with respect to claims 12-17 have been fully considered but they are not persuasive.

Specifically, examiner maintains that Sugama teaches in paragraph 172 that the core channels are bent, which implies some measure of curvature. Examiner still conveys that applicant's own disclosure, page 8, indicates that a curved section can follow a turn of approximately 90 degrees, so the teaching of Sugama that the bend is nearly perpendicular does not preclude its consideration as a curved section.

Applicant's referral to the teaching that the wiring of Sugama is orthogonal to each other on different layers is erroneous, as this teaching is specifically related to Figure 13. The different layers can easily be seen by the dotted lines of wires 12, which lie on a plane below wires 13. However, this is not the case in Figure 14, which has been relied upon in the rejection of the claims. Figure 14 shows wires 12 and 13 bent in the same plane

to form a curved section at the point of bending. Furthermore, the curved section is exposed to ambient air at point 16.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12 and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by US 2002/0118907 to Sugama et al.

Regarding claim 12, Sugama teaches a waveguide system comprising a bottom cladding layer (21); a core channel (23) having a curved section which follows a curved path (Figure 14); and a selectively patterned top cladding layer (27) formed on top of both the bottom cladding layer and the core channels such that the core channel is sandwiched between the bottom and the top cladding layer, wherein the top cladding layer is selectively patterned to have at least one opening (16) that exposes the curved section of the core channel to the ambient air so that a radius of the curved section is smaller than otherwise possible the top cladding layer covers the curved section (Figure 14).

Regarding claim 14, Sugama teaches that the curve opening exposes a curved section of more than one core channel (Figure 14).

Regarding claim 15, Sugama teaches that the curved path of the curved section of the core channel follows a turn of approximately 90 degrees or more (Figure 14).

Regarding claim 16, Sugama teaches that the patterned top cladding layer has at least one access via (as in Figure 26, elements 34, 35) that exposes the core channel to the ambient air, whereby the access via provides access for optical communication with the exposed core channel.

Regarding claim 17, Sugama teaches an external optical device (lens 36, Figure 23) placed proximate to the access via (34) such that the external optical device is in optical communication with the exposed core channel.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-11, 18-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugama.

Regarding claim 1, Sugama teaches a waveguide system comprising a bottom cladding layer (22); a plurality of core channels (23) suitable for optical transmission formed on top of the bottom cladding layer; a patterned top cladding layer (27, specifically Figures 16G and 16H) formed on top of both the bottom cladding layer and the core channels such that the core channels are sandwiched between the bottom and

the top cladding layer; and a plurality of lenses (Figure 12, elements 4) formed on a bottom cladding layer and positioned in an optical path of a plurality of core channels. However, Sugama does not teach that the plurality of lenses is formed on the specific cladding layers as taught in the embodiment of Figure 16, but rather teaches this limitation in a separate embodiment. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Figure 16 embodiment of Sugama to include similar lenses as in the Figure 12 embodiment. The motivation would have been to improve light confinement and alignment. Such a modification would appear to leave the added lenses exposed to ambient air due to the design of the patterned top cladding layer found in Figure 16.

Regarding claim 2, Sugama renders obvious the limitations of the base claim 1. Sugama also teaches that the plurality of optical lenses are spaced from the ends of the core channels so that the ambient air is provided between the ends of the core channels and the plurality of optical lenses (Figures 10 and 12).

Regarding claim 18, Sugama teaches an apparatus, comprising: a light source (inherently present in the apparatus described below given that light is present to be transmitted, received, and detected), a multi-channel transmission waveguide coupled to receive light from the light source, the transmission waveguide producing a set of beams by guiding the light received from the light source so that the set of light beams emanate from the transmission waveguide in a first direction (Figures 11 and 16 and paragraph 59, page 4); a multi-channel reception waveguide spaced apart from the transmission waveguide in the first direction, the reception waveguide receiving the set

of light beams emanating from the transmission waveguide (Figures 11 and 16 and paragraph 59, page 4); wherein the transmission and the reception waveguide are each formed of at least, a bottom cladding layer (21); a plurality of core channels (23) suitable for optical transmission formed on top of the bottom cladding layer, each of the core channels having a first end and a second end; and a patterned top cladding layer (27, specifically Figures 16G and 16H) formed on top of both the bottom cladding layer and the core channels such that the core channels are sandwiched between the bottom and the patterned top cladding layer; a plurality of optical lenses (Figure 12, elements 4) formed on a bottom cladding layer and positioned in the optical path of a plurality of the core channels; and a light detector (paragraph 295, page 14) optically coupled to the reception waveguide to receive light from the reception waveguide, the light detector including a plurality of light detecting elements that detect light intensity of the light from the reception waveguide (Figures 42D and 43C indicate a photodetector (83) for each of a multiple number of access holes). However, Sugama does not teach that the plurality of lenses is formed on the specific cladding layers as taught in the embodiment of Figure 16, but rather teaches this limitation in a separate embodiment. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Figure 16 embodiment of Sugama to include similar lenses as in the Figure 12 embodiment. The motivation would have been to improve light confinement and alignment. Such a modification would appear to leave the added lenses exposed to ambient air due to the design of the patterned top cladding layer found in Figure 16.

Regarding claims 3 and 20, Sugama renders obvious the limitations of the base claims 1 and 18, respectively. Sugama also teaches that at least some of the core channels have a curved section wherein a lengthwise portion of a respective core channel follows a curved path (Figure 14), and where in the patterned top cladding layer has at least one curve opening (16) that exposes the curved section of the core channel to the ambient air.

Regarding claim 5, Sugama teaches the limitations of the base claim 3. Sugama also teaches that the curve opening exposes a curved section of more than one core channel (Figure 14).

Regarding claim 6, Sugama teaches the limitations of the base claim 3. Sugama also teaches that the shape of the curve opening conforms to the curved path of the curved section of a respective core channel (Figure 14).

Regarding claims 7 and 22, Sugama teaches the limitations of the base claims 3 and 20, respectively. Sugama also teaches that the curved path of the curved section of the core channel follows a turn of approximately 90 degrees or more (Figure 14).

Regarding claims 8 and 23, Sugama teaches the limitations of the base claims 1 and 18, respectively. Sugama also teaches that the patterned top cladding layer has at least one access via (as in Figure 26, elements 34, 35) that exposes the core channel to the ambient air, whereby the access via provides access for optical communication with the exposed core channel.

Regarding claims 9 and 24, Sugama teaches the limitations of the base claims 8 and 23, respectively. Sugama also teaches an external optical device (lens 36, Figure



23) placed proximate to the access via (34) such that the external optical device is in optical communication with the exposed core channel.

Regarding claim 10, Sugama teaches the limitations of the base claim 8.

Sugama also teaches that the access via exposes a plurality of core channels to the ambient air, whereby the access via provides access for optical communication with the exposed core channels (Figure 26 teaches several exposed core channels).

Regarding claim 11, Sugama teaches the limitations of the base claim 1.

Sugama also teaches that the core channels are formed of a polymer material (page 12, paragraph 247).

Regarding claim 19, Sugama teaches the limitations of the base claim 18.

Sugama also teaches that the apparatus is an input device for an electronic device (wiring substrate, throughout), and wherein the input area is produced between the transmission waveguide and the reception waveguide (Figure 11).

Claims 4, 13, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugama in view of US Patent to Nakamura et al., number 5,604,835.

Regarding claims 4, 13, and 21, Sugama teaches or renders obvious the limitations of the base claims 3, 12, and 20, respectively. Sugama also teaches that the index of refraction of the core channels is greater than the index of refraction of the bottom cladding layer and of the ambient air (page 8, paragraph 156). Furthermore, Sugama teaches that the index of refraction of the core channels is at least 0.3 greater than the index of refraction of the ambient air (page 8, paragraph 156). Sugama does

not teach that the index of refraction of the core channels is at least 0.3 greater than the index of refraction of the bottom cladding layer. Nakamura teaches a waveguide system (apparatus) wherein the index of refraction of the core material is at least 0.3 greater than the index of refraction of the cladding material (column 5, lines 11-15). Furthermore, Nakamura teaches a core material with index of refraction at least 0.3 greater than the index of refraction of the bottom cladding layer of Sugama (Nakamura, column 5, lines 11-15, Sugama, page 8, paragraph 156). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the core material of Nakamura in the waveguide system (apparatus) of Sugama. The motivation would have been to improve the confinement of light in the core channels.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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JMB

  
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